An Expert System Shell as a Cost-Effective Tool for Predicting Preterm Birth Risk

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We have developed an object-oriented expert system shell named Gestation Predictor. This expert system shell utilizes Level5 Object v. 3.5 for Microsoft Windows. This shell is designed for use by clinical professionals during the clinical encounter with pregnant women for preterm birth risk screening. The interactive electronic poster will offer a knowledge base mangment tool for predicting gestation in pregnant women. The goal of this project is to improve clinical outcomes for childbearing families with cost-effective expert system technology.

The Need for Accurate Assessment

Accurately assessing preterm risk is critical for the prevention of preterm birth. Early diagnosis of preterm labor risk is crucial if delivery is to be delayed. [1] Accurate assessment of mothers who are at high risk will allow for educational interventions and symptom management that can prolong gestation. The reduction of early delivery will increase perinatal survival and thus reduce preterm mortality and morbidity.[1] Accurate assessment that leads to prolonged gestation will help contain health care cost.[2]

Economic Impact

Preterm birth resulting in neonatal intensive care have been identified as the most expensive health care problem in medicine today.[1] The cost of neonatal intensive care has risen faster than the cost of cancer, renal transplants and myocardial infraction.[2] The cost for many preterm babies exceeds $1,000,000 in the first year of life .[3]

System Inputs & Outputs

The primary output of this system is the prediction of gestation at delivery, preterm delivery (prior to 37 weeks) and full-term delivery (37+ weeks).
The nature of the input data is that it comes from the patients themselves and the clinical assessment of these patients. Our input data is broken into seven primary clinical assessment areas to include: Demographics; Occupation Factors; Risk Factors; Pre-Existing Conditions; Pregnancy Complications; Subjective Symptoms; and Drug Therapy.

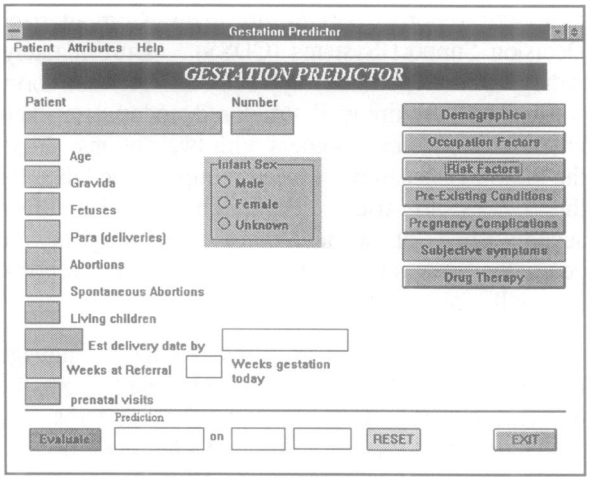

Figure 1 is a clip from the expert system shell.

The expert system shell offers a cost-effective way of extending expert knowledge to areas with poor medical care access (i.e. inner urban areas and rural communities). The system is designed to serve as an expert "tool", during the clinical encounter, for predicting gestation in pregnant women. The system will offer a "prediction" but it does not replace clinical judgement and perinatal skills necessary to arrive at a final diagnosis of preterm labor.

References

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